CLAIMS

1. A method of signalling between communication equipments (100, 200, 300) in a communication system adapted to transmit first data from a first communication equipment (100) to a second communication equipment (200) by modulating a carrier signal according to a first set of constellation points having a first minimum distance between constellation points corresponding to first and second values of the first data, the method comprising:

transmitting first and second data simultaneously by modulating the carrier signal according to a second set of constellation points arranged in a constellation plane, wherein the second set of constellation points is arranged such that:

a first subset of the second set of constellation points located in a first part of the constellation plane correspond to a first value of the first data;

a second subset of the second set of constellation points located in a second part of the constellation plane correspond to a second value of the first data;

wherein each of the first and second subsets comprises constellation points corresponding to at least first and second values of the second data; and

wherein the minimum distance between the constellation points of the first subset and the constellation points of the second subset is not less than the first minimum distance.

2. A method as claimed in claim 1, wherein the minimum distance between the constellation points of the second set of constellation points and the perpendicular bisector of the straight line joining the closest two points corresponding respectively to first and second values of the first data in the first set of constellation points is not less than half the first minimum distance.

3. A method as claimed in claim 1 or 2, wherein each of the first and second subsets comprises two constellation points.

4. A method as claimed in claim 1, 2 or 3, wherein the second set of constellation points includes the first set of constellation points.

5. A method as claimed in claim 4, wherein the first set of constellation points comprises points $(-x_1, -y_1)$ and $(x_2, y_2)$, the first subset of the second set of constellation points comprises points $(-x_1, -y_1)$ and $(-x_3, -y_3)$, the second subset of the second set of constellation points comprises points $(x_2, y_2)$ and $(x_4, y_4)$, where $x_3>x_1$, $x_4>x_2$, $y_3>y_1$ and $y_4>y_2$, where $x_1$, $x_2$, $x_3$, $x_4$, $y_1$, $y_2$, $y_3$, $y_4$ are positive numbers.

6. A method as claimed in claim 5, wherein substantially $x_1=x_2=y_1=y_2$ and $x_3=x_4=y_3=y_4=2x_1$.

7. A method as claimed in claim 1, 2 or 3, wherein the first set of constellation points comprises points $(-x_1, -y_1)$ and $(x_2, y_2)$, the first subset of the second set of constellation points comprises points $(-x_5, 0)$ and $(0, -y_5)$, the second subset of the second set of constellation points comprises points $(0, y_6)$ and $(x_6, 0)$, and $x_5\geq 2x_1$, $x_6\geq 2x_2$, $y_5\geq 2y_1$ and $y_6\geq 2y_2$, where $x_1$, $x_2$, $x_5$, $x_6$, $y_1$, $y_2$, $y_5$, $y_6$ are positive numbers.

8. A method as claimed in claim 7, wherein substantially $x_1=x_2=y_1=y_2$ and $x_5=x_6=y_5=y_6=x_1$.

9. A method as claimed in claim 1 or 2, wherein each of the first and second subsets comprise four constellation points.

10. A method as claimed in claim 9, wherein in each subset of four constellation points, a first pair of constellation points correspond to respectively the first and second values of the second data, and a second pair

of constellation points correspond to respectively the first and second values of the second data, and further comprising switching between transmission of the first and second pair according to a predetermined criterion.

11. A method as claimed in claim 9, further comprising transmitting third data simultaneously to the first and second data, wherein, in each subset of four constellation points, first and second pairs of constellation points correspond respectively to first and second values of the third data.

12. A method as claimed in claim 10 or 11, wherein in the first subset of four constellation points the first pair of constellation points is $(-x_1, -y_1)$ and $(-x_3, -y_3)$, and the second pair of constellation points is $(-x_5, 0)$ and $(0, -y_5)$, and in the second subset of four constellation points the first pair of constellation points is $(x_2, y_2)$, and $(x_4, y_4)$, and the second pair of constellation points is $(0, y_6)$ and $(x_6, 0)$, where $x_3>x_1$, $x_4>x_2$, $x_5\geq 2x_1$, $x_6\geq 2x_2$, $y_3>y_1$, $y_4>y_2$, $y_5\geq 2y_1$ and $y_6\geq 2y_2$, where $x_1$, $x_2$, $x_3$, $x_4$, $x_5$, $x_6$, $y_1$, $y_2$, $y_3$, $y_4$, $y_5$, and $y_6$ are positive numbers.

13. A method as claimed in claim 12, wherein substantially $x_1=x_2=y_1=y_2$and $x_3=x_4=x_5=x_6= y_3=y_4=y_5=y_6=2x_1$.

14. A method as claimed in any one of claims 1 to 13, comprising receiving the modulated carrier signal at first and second receiving equipments and at the first receiving equipment demodulating only the first data, and at the second receiving equipment demodulating at least the second data.

15. A communication equipment (100) for transmitting first and second data simultaneously in a communication system adapted to communicate the first data by modulating a carrier signal according to a first set of constellation points having a first minimum distance between constellation points corresponding to first and second values of the first data, the communications equipment (100) comprising:

modulation means (110) adapted to modulate the carrier signal according to a second set of constellation points arranged in a constellation plane, wherein the second set of constellation points is arranged such that:

a first subset of the second set of constellation points located in a first part of the constellation plane correspond to a first value of the first data;

a second subset of the second set of constellation points located in a second part of the constellation plane correspond to a second value of the first data;

wherein each of the first and second subsets comprises constellation points corresponding to at least first and second values of the second data; and

wherein the minimum distance between the constellation points of the first subset and the constellation points of the second subset is not less than the first minimum distance; and

transmitter means (120) for transmitting the modulated carrier signal.

16. A communication equipment (100) as clamed in claim 15, wherein the modulation means (110) is adapted to modulate the carrier signal in accordance with any of claims 2 to 13.

17. A communication system comprising a first communication equipment (100) as claimed in claim 15 or 16,

a second communication equipment (200) having

first receiving means (210) for receiving the modulated carrier signal and first demodulation means (220) adapted to derive only the first data

and

a third communication equipment (300) having

second receiving means (310) for receiving the modulated carrier signal and first demodulation means (320) adapted to derive at least the second data.